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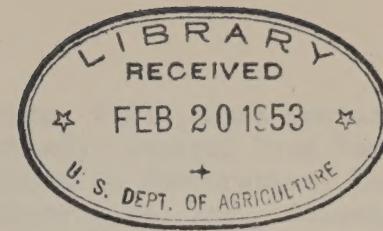
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## PART I

## POWER DIVISION REPORT

for

FISCAL YEAR 1952

Generation and Transmission Loan Program

Generation and transmission loans made by REA during the year amounted to \$61,397,982, representing approximately 37% of all money loaned by REA in fiscal year 1952. This figure includes \$10,084,179 loaned to distribution borrowers for transmission facilities. The following tabulation shows the generation and transmission loans made each fiscal year and the cumulative amount of loans for these facilities at the end of each fiscal year since the inception of REA:

<u>Fiscal Year</u>	<u>Loans During Fiscal Year</u>	<u>Cumulative Loans End of Fiscal Year</u>
1952	\$ 61,397,982	\$490,147,938
1951	51,158,631	428,749,956
1950	136,439,210	377,591,325
1949	85,000,526	241,152,115
1948	39,978,033	156,151,589
1947	33,329,895	116,173,556
1946	31,920,043	82,843,661
1945	5,719,924	50,923,618
1944	3,017,750	45,203,694
1943	1,695,294	42,186,144
1942	28,162,700	40,490,850
1941	5,612,150	12,328,150
1940	568,000	6,716,000
1939	3,484,000	6,148,000
1938	1,154,000	2,664,000
1937	1,482,000	1,510,000
1935 -36	28,000	28,000

At the beginning of fiscal year 1951, the cumulative dollar amount of generation and transmission loans accounted for 17.7 percent of all REA loans, while at the end of the fiscal year generation and transmission loans accounted for 19.6 percent of all REA loans.

Loans in the amount of \$9,548,000 were made to two new federated power cooperatives--L & O Power Cooperative, Inc., Rock Rapids, Iowa, and Plains Electric Generation and Transmission Cooperative, Albuquerque, New Mexico. Loans in the amount of \$32,831,500 were made to 11 existing federated power cooperatives--Corn Belt Power Cooperative, Humboldt, Iowa; N. W. Electric Power Cooperative, Inc., Cameron, Missouri; Sho-Me Power Corporation, Marshfield, Missouri; Northern Michigan Electric Cooperative, Inc., Boyne City, Michigan; Central Electric Power Cooperative, Jefferson City, Missouri; M & A Electric Power Cooperative, Poplar Bluff, Missouri;



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Brazos River Transmission Electric Cooperative, Inc., Waco, Texas; East Kentucky Rural Electric Cooperative Corporation, Winchester, Kentucky; Central Iowa Power Cooperative, Inc., Cedar Rapids, Iowa; Rushmore G & T Electric Cooperative, Inc., Rapid City, South Dakota; and Central Electric Power Cooperative, Inc., Columbia, South Carolina. The balance of \$9,693,000 was loaned to distribution-type borrowers for new or additional generation facilities.

The loans made will provide for 98,695 kw consisting of: the construction of one new steam plant of 30,000 kw and an addition to existing steam plant of 40,000 kw and one Diesel plant of 13,500 kw; the acquisition of one 10,000 kw steam plant, one hydro plant of 2,000 kw, an addition to three existing hydro plants totaling 1,000 kw; the acquisition of two plants of hydro and Diesel totaling 2,195 kw. The construction of 1,759 miles of transmission line and related facilities for power-type borrowers will be provided for also.

As to the future of the generation and transmission loan program, we anticipate a demand by the borrowers which will at least maintain the present level and there is a very good prospect of a rapid increase in the amount required for the program. In the face of current predictions by Government agencies concerned and others competent in the utility field that the Nation faces an impending power shortage, we cannot anticipate any substantial reduction in the funds required for the program, if our borrowers are to be assured of dependable power sources. Often predictions as to load growth have been rather low rather than high which requires that REA give the most careful consideration to the generation program in order to avoid the widespread shortages that faced our borrowers in recent years. Reports from governmental agencies indicate that manufacturers of large generating equipment are booked to capacity through 1953 and a substantial portion of the 1954 production capacity has also been booked. We, therefore, can anticipate that the lead time for completion of additional power capacity will tend to increase rather than decrease. By necessity, planning will have to be on a longer range basis than has been in the past. Should the power companies continue to underestimate the growing power needs of the Nation, we can expect the demand for generation and transmission loans to increase substantially. Should requirements for military production increase, the serious impending power shortage will become a reality throughout the Nation.

Construction

During the fiscal year 1952, REA borrowers placed in operation 101,906 kw of generating capacity. The breakdown of this capacity by types of plants is: steam - 68,250 kw, internal combustion - 33,236 kw, and hydro - 420 kw. At the end of the fiscal year 20 power-type borrowers were operating generating plants, an increase of 2 borrowers during the year, while 52 distribution-type borrowers were operating plants, a decrease of 7 during the year. REA borrowers now have a total of 591,357 kw of generating capacity in operation. This figure does not include the total capacity available, since plants in a standby status are not included. Power-type borrowers account for 449,760 kw



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capacity. Of the total capacity in operation, 300,750 kw is steam-electric generating capacity, 254,466 kw is internal combustion-electric generating capacity, and the remainder of 36,141 kw is hydroelectric generating capacity.

Power-type borrowers energized 1,297 miles of transmission line during the fiscal year. Of this mileage energized, 904 miles were 69 kv lines, 196 miles were 34.5 and 44 kv lines, and 197 miles were lines operating at 115 kv and above.

The construction of generation and transmission facilities by REA borrowers during the fiscal year was greater than in any previous year. The following table is an indication of the generation and transmission loan and construction program during the peak years:

	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
G&T Loans	\$85,000,526	\$136,439,210	\$51,158,131	\$61,397,982
G&T Construction				
Contracts	46,706,354	45,308,888	70,123,863	74,089,340
G&T Advance of Funds	34,111,883	44,696,138	57,730,667	55,577,801

The construction of borrowers' facilities during the fiscal year was under the controlled materials program. In general, the allotments of copper, aluminum, and steel were sufficient to enable borrowers to carry out their planned construction programs, although some delays resulted from their inability to procure steel. The Power Division was able to minimize delays in the construction of generating plants and substations by providing borrowers expediting assistance for certain items of equipment through its liaison activity with NPA and DEPA. This was a difficult task.

#### Technical Operations

An increasing amount of assistance in the technical operation and maintenance phases of generation and transmission facilities was rendered to selected borrowers during the year. Approximately 150 field visits were made by operating specialists, a majority of which were upon request of the borrowers. Of the total, 16 visits were made to borrowers with steam plants. Further increases in the amount of assistance in steam plant operation and maintenance can be expected as more and more steam plants, now under construction, are energized. Technical assistance in the field included considerable work in establishing schedules for preventive maintenance training of plant operators, suggestions and recommendations for plant and system protection against fires and other destructive accidents. Assistance in AC network tabulating board studies has become increasingly important.

During the year a method was devised for evaluating plant performance on the basis of the performance anticipated in the power cost study prepared to justify the construction and operation of the generating facilities. Results



show that 56.4 percent of the internal combustion plants supplying all or the major portion of the borrowers' energy requirements are performing as well or better than expected. Because of non-operational difficulties, 23.1 percent are not attaining planned performance. A thorough and detailed analysis of the operations of the remaining 20.5 percent has been made and a program initiated to provide whatever assistance is necessary to achieve economical operation. The fact that over half of these plants are performing as well or better than expected is remarkable in view of the lag between the date of the power cost study and the date of plant energization, and the greater operating and production costs of today.

During the fiscal year 1952 the publishers of the Diesel Progress magazine established the annual "Diesel Progress Award," a bronze plaque, to be presented to the most efficiently operated internal combustion generating plant owned by an REA borrower. The purpose of this award is to promote improved efficiency and economy in borrowers' plant operations. REA is cooperating with the publishers of Diesel Progress and the panel of award judges by supplying the data necessary to evaluate plant performance for the selection of the award winner. The award plaque was presented to the Graham County Electric Cooperative, Inc., of Pima, Arizona, for the calendar year 1951.

During May of 1952 REA sponsored a four-day generating plant operators' meeting in Milwaukee, Wisconsin, for the purpose of bringing together plant superintendents and operators of internal combustion and steam generating plants in order to discuss problems relating to the technical operation and maintenance of these types of generating plants. Engineers from a number of manufacturers that make internal combustion and steam generating equipment attended and participated in the technical sessions of the meeting. Approximately 130 conferees attended with a large majority of the cooperatives furnishing the bulk of their own power being represented. It is expected that as a result of this meeting, improved and more efficient operation and maintenance will be experienced by the borrowers. The meeting was well received and borrowers' personnel present requested REA to continue these meetings annually.

#### General Management

As of the close of the fiscal year there were 39 power-type borrowers, exclusive of three which had repaid their loans in full. Two new power-type borrowers received their initial loans during this period. Of the 39 power-type borrowers, 26 were in operation, 5 were in initial construction, and 8 were still in a pre-construction stage. All power-type borrowers were meeting current debt service obligations and 4 borrowers had advance payments totaling \$354,584 at the end of fiscal year 1952.

Fiscal 1952 marked significant progress in the standardization of formalized management tools for the more effective rendering of general and operating advice and assistance to the power-type borrowers. During the



year a standard method of preparing annual operating budgets was prepared and furnished the borrowers; a standard text for checking and analyzing borrowers' monthly operating reports was prepared and effectuated; and work on the first of a series of comprehensive management surveys of power-type borrowers was begun. In addition, an intensive program directed toward the adoption by power-type borrowers of the Capital Credits Plan was undertaken as part of REA's overall management program.

A week long work conference for board members and managers of power-type borrowers was sponsored, arranged, and conducted by the Power Division. A considerable part of the conference program dealt with power-type borrowers' power use activities which subsequently resulted in the installation by a number of the borrowers of active power use programs.

In addition to programs directed to all power-type borrowers, considerable time and attention was required in assisting borrowers on specific day to day problems relative to cooperative organization and principles, physical system service arrangements, member and public relations, internal controls and procedures, and construction fund budgeting.

#### Standardization

Very satisfactory progress is being made in the development of standard plans and specifications for steam-electric generating plants, a project which the engineering profession has hitherto dismissed as completely impractical on account of the past rapid technological development in this field. This development is now proceeding at a slower rate for our sizes of plants and we believe the time is ripe for standardization. Our program provides not only for flexibility in designs to keep abreast of progress but also, we are convinced, for more effective competition in this branch of industry than has hitherto prevailed.

By attacking first the development of standard functional specifications of the principal components of steam-electric generating plants, we are breaking the job down into manageable pieces, and already approximately 40 percent of the major component specifications are nearing completion. Six have been issued as REA Standard Specifications and these have proved their value to our borrowers many times over. They have enabled important equipment to be ordered within a few days of the date of the execution of the construction loan. Included in the equipment so ordered has been the turbine-generator, which is not only the most expensive single piece required in a complete plant but also the one which requires the longest period for its manufacture. Hitherto, six weeks have usually elapsed before this equipment could be purchased competitively, so that a saving of at least a month in the in-service date of REA steam plants has been made possible by the standardized specifications for this one item.

One quite unexpected and substantial advantage accrued to a borrower solely because our standard specification was available for the turbine-generator equipment. Prices had been rising in the power equipment field, and one



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Saturday a large manufacturer published notice of a 10 percent rise in its prices on turbine-generators. Our borrower had been contemplating inviting bids on a large turbine-generator unit, and immediately instructed its engineer to invite bids on its unit--bids to be opened the following Friday. All manufacturers of this equipment had already been made familiar in detail with our specification, and all submitted bids on the Friday as requested. The low bid was submitted by one of the manufacturers which had not yet announced a price increase--it was low by \$86,600. The next day this low bidder announced its price increase, which, if applied to the bid in question would have raised that bid by 10 percent or \$94,300.

At the present time, our efforts are being devoted to the preparation of more standards for the major components of steam-electric generating plants. We will attack the standardization of construction contracts and bidding procedures as soon as manpower can be devoted to that, and anticipate that opportunities will thereby be developed for more economical construction practices and supervision. In REA's standardization activities in the distribution and transmission fields, by far the greatest benefits accrued from the work done in the organization of construction which became feasible when design standardizations had been effected. Similar benefits should accrue in the generation field as the design standardization activity proceeds.

### Power Supply

The procurement of adequate, low-cost, and reliable power is basic to the orderly growth of the REA program. The increased needs for energy of the REA borrowers has continued at an unprecedented rate. The energy increase for this past fiscal year has been more than 20 per cent over that for 1951 compared with the 9.7 per cent increase for the industry as a whole. The over-all cost of power to REA borrowers has continued down in spite of increased costs. The following factors have contributed to this decline:

- (a) The expansion of public power installations, resulting not only in the direct availability of lower cost power but also in the effect that these projects have in getting reductions in the wholesale rates of existing suppliers.
- (b) Loans made by REA for the construction of generation and transmission systems, and the effect that these loans have had upon the rates charged by commercial suppliers.
- (c) Some applications for generation and transmission loans have resulted in lower wholesale rates from existing suppliers, even though the loans have not been made.

The following pertinent summaries indicate the scope of REA procurement activities during the past year. In the northeastern states, high power costs still prevail and several companies have made rate increases which further handicap the cooperatives' ability to make adequate low cost power available



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for rural consumers. The situation is further aggravated by inadequate transmission facilities to rural load centers. The power outlook for cooperatives in Virginia will be improved with the conclusion of negotiations for a wheeling agreement between the Southeastern Power Administration and Virginia Electric and Power Company. This will make increased capacity available to these cooperatives together with a reduction in their power cost from 7.5 mills to approximately 7.0 mills per kwh. Negotiations have not been completed for the wheeling of Bugs Island power to North Carolina cooperatives served by the Carolina Power and Light Company. Rate reductions have been made by all of the power companies in the state of Ohio, varying from 0.2 mill per kwh to 1.3 mill per kwh. The effect of these rate reductions will save the Ohio cooperatives approximately \$325,000 a year, based on their present purchases. In the southeast, several contract provisions have been modified which will enable some of the cooperatives to earn a lower average rate, and have eliminated the need of the cooperatives to carry special insurance coverage.

In Iowa, several of the cooperatives have negotiated contracts with the Bureau of Reclamation in order to purchase power from the Missouri River Project. In North Dakota, the Minnesota Power Cooperative and Northern States Power Company have completed an interconnection which will increase the operating reserve capacity of the combined systems by approximately 13,800 kw and result in lower over-all generating costs. The Northern States Power Company and the Otter Tail Power Company have also entered into an agreement which will reduce the cost of power to several cooperatives in Minnesota by 4.0 mills per kwh and result in an approximate saving of \$142,000. The William J. Neal generating station of the Central Power Electric Cooperative of North Dakota was placed in operation in 1952. Eight cooperatives in North Dakota began receiving service from that source and will save approximately 4.0 mills per kwh, or an annual saving of \$184,000. A group of some twenty cooperatives in Minnesota, together with the Northern States Power Company, the Otter Tail Power Company and the Interstate Power Company have been seeking an appropriation which would enable the Bureau of Reclamation to construct certain transmission lines in Minnesota. Construction of such facilities would make lower cost Missouri Basin power available. Completion of a 115 kv transmission loop now under construction by the Bureau of Reclamation in Eastern South Dakota will relieve the power shortage which now exists in that area. This loop will be energized by power supplied by the Northern States Power Company at Sioux Falls until completion of the Fort Randall hydro plant, after which the Bureau will take over operation of the transmission loop and the twenty-one distribution cooperatives in the area will be supplied by the Bureau under their standard rate of about 5.6 mills per kwh. The price now paid by these cooperatives ranges from 1.17 cents per kwh to 2.24 cents per kwh. Power shortages and high costs prevail in the area of South Dakota west of the Missouri River. This situation will be remedied upon completion of transmission facilities under construction or proposed by the Bureau of Reclamation which will make Missouri River Basin power available to this section of South Dakota.

Thirteen cooperatives in Kansas have recently obtained rate reductions through a statewide engineering study of other possible methods of power supply.



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Several cooperatives in Colorado have recently had their wholesale rates increased by approximately 12 per cent. The new 10,000 kw generating station of the M & A Electric Cooperative near Essex, Missouri, was put in operation in August 1951 and is now supplying all or part of the electric requirements of three member cooperatives. Construction is progressing satisfactorily on transmission and generating stations of the Central Electric Power Cooperative and the N. W. Electric Power Cooperative. It is expected that these facilities which will relieve the power shortage which has long existed in certain areas in central and northwest Missouri, will be completed and put into operation in the not too distant future. These two power cooperatives, by means of lease operating agreements with the Southwest Power Administration will also bring the advantage of low cost hydro power into this area.

In Montana, three cooperatives started taking service from the Bureau of Reclamation. As a result, the cost of power purchased by these cooperatives has been reduced by 3.0 mills per kwh. Orcas Power and Light Company started taking power from the Bonneville Power Administration on July 18, 1951, upon completion of the Bonneville's submarine cable to Orcas Island. As a result, the cooperative is saving approximately 1.0¢ per kwh on its energy for Eastsound, Lopez and Shaw Islands. The cooperative had previously been generating its power requirements for these islands. The cooperative's Friday Harbor Diesel plant is still being used.

In Alaska, an agreement has been negotiated between the Chugach Electric Association and the Anchorage Public Utilities. This agreement eliminates the need of constructing a 69 kv transmission line from Anchorage to Palmer in order to supply the requirements of Matanuska Electric Association. This agreement will also prevent a critical power shortage in the Matanuska Electric Association area providing the Chugach Electric Association's steam generating plant is completed as scheduled. Golden Valley Electric Association is continuing to purchase a limited quantity of power from the City of Fairbanks. It is anticipated, however, that the cooperative will acquire generating facilities of the U. S. Smelting, Refining and Mining Company in the near future which will alleviate this condition.

While there have been improvements as noted above, it is still necessary for the suppliers in the country to continue to add generating capacity and transmission facilities at an increasing rate in order to keep pace with increasing needs.

